Amendments in the claims:

1. (original) An apparatus for cavity enhanced optical detection comprising:

a) a source of optical radiation

b) a resonant optical cavity which provides a round trip path for said optical radiation said cavity comprising:

i) a plurality of mirrors, a first mirror of said plurality being an input mirror which receives said optical radiation from said source and inputs same into said cavity;

ii) a flow cell positioned within said cavity, said flow cell comprising at least a first analysis channel which accommodates a flow of analyte fluid there through, the exterior wall of said at least first flow channel closest to said source of optical radiation intersecting said round trip radiation path at an angle approximately equal to Brewster's angle;

iii) a second mirror of said plurality of mirrors, which second mirror receives the radiation from said optical source after passage of said radiation through both said input mirror and said at least first analysis channel and reflects at least a portion of said received radiation;

whereby said resonant optical cavity provides a round trip path for analyte fluid having at least two different refractive index values and the location of the point at which said reflected radiation impinges on said input mirror is substantially the same as the point from which said first mirror

inputs said radiation into said cavity notwithstanding changes in the refractive index of said analyte fluid or the wavelength of said radiation.

2. (original) The apparatus of claim 1, wherein said first input mirror is concave and said second mirror is substantially planar.

3. (original) The apparatus of claim 1, wherein said flow cell further comprises:

i) a second analysis channel which second channel intersects said radiation path at an angle which is substantially equal, but opposite to, the angle at which said first analysis channel intersects said radiation path; and

ii) a fluid inlet channel in fluid communication with both said first and second analysis channels.

4. (original) An apparatus in accordance with Claim 1 which also comprises:

a) a 50/50 beam splitter interposed between said optical source and said input mirror; and

b) a photo-detector in optical communication with said beam splitter.

5. (currently amended) An ~~an~~ apparatus in accordance with Claim 1 wherein said optical cavity and said flow cell comprise an integral structure.

6) (original) An apparatus in accordance with Claim 1 wherein said optical cavity is a ring resonator which comprises: a concave input mirror and two substantially planar mirrors, said two planar mirrors covering at least a portion of two facets of a triangular prism with said concave input mirror facing the third facet of said prism, and wherein said analysis channel is positioned between said third face and said concave input mirror.

7) (original) An apparatus in accordance with Claim 1 wherein said optical radiation is continuous wave.

8) (original) An apparatus in accordance with Claim 1 wherein said optical radiation is pulsed.

9) (original) An apparatus in accordance with Claim 1 wherein said source of optical radiation is a laser.

10) (currently amended) An apparatus in accordance with Claim 1 wherein said source of optical ~~opticxal~~ radiation is an incoherent light source.

11) (original) An apparatus in accordance with Claim 1 wherein said source of optical radiation is mode match coupled to said resonant cavity.

12) (original) An apparatus in accordance with Claim 1 wherein the wavelength of said optical radiation is variable over time.

13) (original) An apparatus in accordance with Claim 1 wherein the interior wall surface of said at least one flow channel distal said source of optical radiation intersects said round trip radiation path at an angle approximately equal to Brewster's angle.

14) (original) An apparatus according to Claim 1 which also comprises a semi-conductor diode photo detector.

15) (currently amended) An apparatus in accordance with Claim 1 wherein said source of optical radiation is broad band ~~which after~~ and wherein light emitted from said optical cavity is dispersed onto an array detector.

16) (original) An apparatus according to Claim 1 wherein said source of optical radiation is broad band and wherein light emitted from said optical cavity is dispersed onto a diode array detector.

17) (currently amended) A cavity ring down spectrometer incorporating the apparatus of Claim 1.

Amendments in the specification

1) Please add the following paragraph at line 2 of page 8:

Fig. 6 shows another embodiment of the invention.

2) Please replace the paragraph at line 16 of page 6 with the following paragraph:

In a second preferred embodiment of the invention, a flow cell having a single analysis channel intersecting the round trip radiation path is employed in a cavity, having a first curved input mirror and a planar second mirror. Although the lateral displacement of an optical beam passing <u>through</u> ~~thorough~~ such a flow <u>cell</u> ~~call~~ depends on the sample index of refraction, displacement of the beam does not lead to misalignment of the cavity, since in this embodiment the planar mirror is aligned to retroreflect the beam. The location of the point at which the round trip radiation path impinges on the input mirror is thus substantially insensitive to changes in the sample refractive index or the laser wavelength, as further explained in the detailed discussion of Figures 3a and 3b.

3) Please replace the paragraph at line 4 of page 14 with the following paragraph:

If the refractive index of sample 16 is changed to a value n_2 which differs from n_1, or if the wavelength of the light source changes then light inside the cavity will follow a different path. In the embodiments of Figures 3a and 3b, with

the refractive index of sample 16 being changed to n_2 (different from n_1), light traveling from mirror 12 to mirror 40 will follow path 36 (solid line) until it reaches the first interface between flow cell 14 and sample 16, which is associated with analysis channel 19. At that point, the beam is refracted through a different angle than the angle of path 36, since the angle of refraction between flow cell 14 and sample 16 for non-normal incidence depends on the refractive index of sample 16. Therefore, the beam follows path 38 (dotted line), which is distinct from path 36 ~~32~~. Round trip radiation path 38 is offset but parallel to path 36 ~~32~~ and impinges on mirror 40 at point 30, which is spaced apart from point 26. However, since mirror 40 is substantially planar and retroreflecting, the optical resonator formed by mirrors 12 and 40 is not misaligned for sample 16 having a refractive index n_2 different from n_1. The lateral displacement of a beam (e.g., the separation of the point of impact of paths 36 and 38 at mirror 40, i.e., 26 and 30) avoids resonator misalignment if mirror 40 is substantially planar. Note, however, that the changing position of the output beam can sometimes become a problem for the collection optics which might have to be realigned in some cases.

4) Please delete the entire abstract on page 22

5) Please add the following new abstract on page 22:

An apparatus for cavity enhanced optical detection having an improved flow cell is provided. Sensitivity of the cavity resonance condition to changes in refractive index of an analyte flowing through the flow cell is reduced. More specifically,

the round trip optical path defined by the resonant cavity intersects a curved cavity input mirror at a point. This point has a location on the input mirror that is substantially independent of the refractive index of the analyte. In this manner, changes in sample refractive index do not lead to misalignment of the resonant optical cavity.

Detailed action --- objections to the drawings

Fig. 3b is objected to for missing a reference sign "9" referenced in the specification. Fig. 6 is objected to for including a sign "Fig. 6" not referenced in the specification.

A replacement drawing sheet for Fig. 3b is filed herewith including the missing reference sign "9". The specification is amended to include Fig. 6 in the brief description of the drawings. No new matter is introduced.

Detailed action --- objections to the specification

The abstract is objected to for improper length and form. Informalities in the description on pages 6 and 14 are objected to.

The abstract as filed is deleted in its entirety. A new abstract is submitted by amendment. The indicated informalities on pages 6 and 14 are corrected by amendment. No new matter is introduced.

Detailed action --- objections to the claims

Claims 5, 10 and 15 are objected to for informal claim language.

The indicated informalities are corrected by amendment. Other informalities that have been noticed at this time in the claims are also corrected. No new matter is introduced.